CURRENT CLAIMS

1-26. Canceled.

27. (New) A method of forming a dielectric layer on a substrate comprising:

    depositing a colloidal dispersion on a substrate;

    curing the colloidal dispersion to form an intermediate layer; and

    infiltrating the intermediate layer with a matrix material to form an infiltrated layer.

28. (New) The method of claim 27, wherein the colloidal dispersion comprises particles of a dense material dispersed in a solvent.

29. (New) The method of claim 28, wherein the dense material comprises a dielectric material or a material convertible to a dielectric material by oxidation or nitridation.

30. (New) The method of claim 27, further comprising curing the infiltrated layer.

31. (New) The method of one of claims 27 or 30, further comprising baking at least one of the colloidal dispersion or the intermediate layer.

32. (New) The method of claim 21, wherein baking comprises at least one bake step wherein the at least one bake step comprises a temperature in the range of about 75 to about 300°C.

33. (New) The method of claim 22, wherein baking comprises at least two bake steps and wherein the bake steps comprise at least one temperature in the range of about 75 to about 300°C.

34. (New) The method of one of claims 27 or 30, wherein curing comprises thermal processing, an annealing method or a combination thereof.

35. (New) The method of claim 24, wherein the annealing method comprises electron beam annealing, ion beam annealing or a combination thereof.

36. (New) The method of one of claims 27 or 30, wherein curing comprises a vacuum atmosphere.

37. (New) The method of one of claims 27 or 30, wherein curing comprises an atmosphere of nitrogen, oxygen, nitrogen-bearing species, oxygen-bearing species, ozone, steam, ammonia, argon, carbon monoxide, carbon dioxide, nitrous oxide, nitric oxide, helium, hydrogen or mixtures thereof.

38. (New) The method of claim 37, wherein the atmosphere comprises oxygen, nitrogen, oxygen-bearing species, nitrogen-bearing species or a combination thereof.

39. (New) The method of claim 27, wherein the infiltrated layer is modified forming the dielectric layer.

40. (New) The method of claim 27, wherein infiltrating the intermediate layer with a matrix material comprises infiltrating the intermediate layer with a coating solution of a spin-on polymer material.

41. (New) The method of claim 40, wherein the spin-on polymer material comprises a material comprising silicates, hydrogen silsesquioxanes, organosilsesquioxanes, organosiloxanes, silsesquioxane-silicate copolymers, silazane-based materials, polycarbosilanes or acetoxysilanes.

42. (New) The method of claim 40, wherein the spin-on polymer material comprises arsenic, antimony, phosphorous or boron.

43. (New) The method of claim 27, wherein the particles of the dense material comprise silica, silicon, silicon nitride, silicon oxynitride, aluminum, aluminum nitride or aluminum oxide.

44. (New) The method of claim 43, wherein the dense material further comprises a species comprising arsenic, antimony, phosphorous or boron.

45. (New) The method of claim 27, wherein the particles have a characteristic dimension between about 2 nanometers and about 50 nanometers.

46. (New) The method of claim 27, wherein the dielectric layer is a pre-metal dielectric layer on an integrated circuit device.

47. (New) The method of claim 27, wherein the dielectric layer fills a trench in a shallow trench isolation structure.

48. (New) The method of claim 27, wherein the dielectric layer fills gaps of dimension less than 100 nanometers.

49. (New) The method of claim 27, wherein the dielectric layer is resistant to standard buffered oxide etchant solutions.

50. (New) The method of claim 27, wherein infiltrating the intermediate layer with a matrix material comprises depositing a matrix material on the intermediate layer by chemical vapor deposition.

51. (New) The method of claim 27, wherein infiltrating the intermediate layer with a matrix material comprises depositing a matrix material on the intermediate layer by atomic layer deposition.

52. (New) The method of claim 27, wherein the matrix material comprises phosphosilicate glass, borosilicate glass or borophosphosilicate glass.

53. (New) A dielectric material formed from the method of claim 27.

54. (New) A dielectric material formed from the method of claim 30.

55. (New) A component comprising the dielectric material of claim 53.

56. (New) A component comprising the dielectric material of claim 54.